

BigBite Analysis

Un-Calibrated 5-Pass MWDC Stability

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Outline

- 1 5.89 GeV MWDC Target Spin = 0°
 - S=0 MWDC t_0
 - S=0 MWDC Track Residuals
- 2 5.89 GeV MWDC Target Spin = 90°
 - S=90 MWDC t_0
 - S=90 MWDC Track Residuals
- 3 5.89 GeV MWDC Target Spin = 270°
 - Bad Timing Calibration
 - S=270 MWDC t_0
 - S=270 MWDC Track Residuals

5.89 GeV Target Spin = 0° Runs

- Our target spin of 0° spans the run sets of
- 1530-1552, With a Shower Threshold of -0.120 mV
- 1702-1719, with a Shower Threshold of -0.133 mV
- The MWDC during the S=0 periods seem to be stable

5.89 GeV t_0 Structure

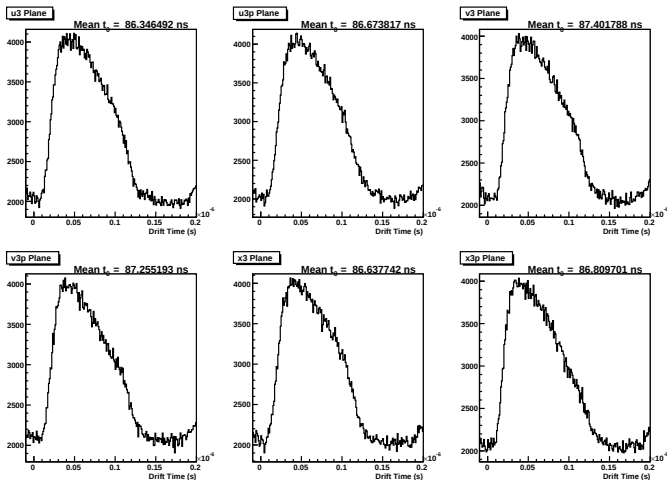


Figure: Characteristic MWDC timing structure for S=0 data. This shows the timing of chamber 3 for run 1539.

5.89 GeV t_0 Stability Chamber 1

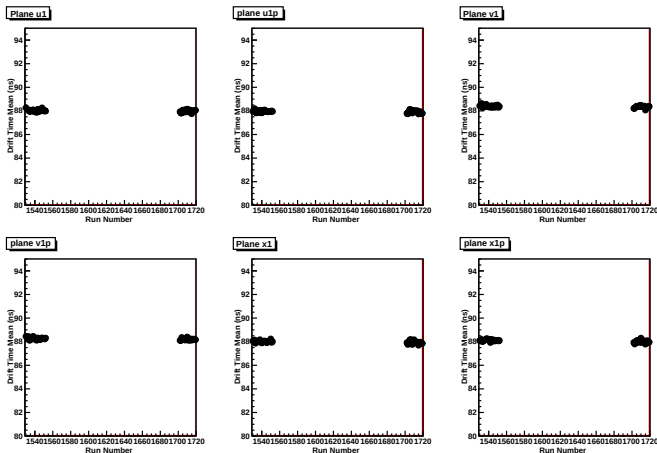


Figure: MWDC timing stability for S=0 chamber 1.

5.89 GeV t_0 Stability Chamber 2

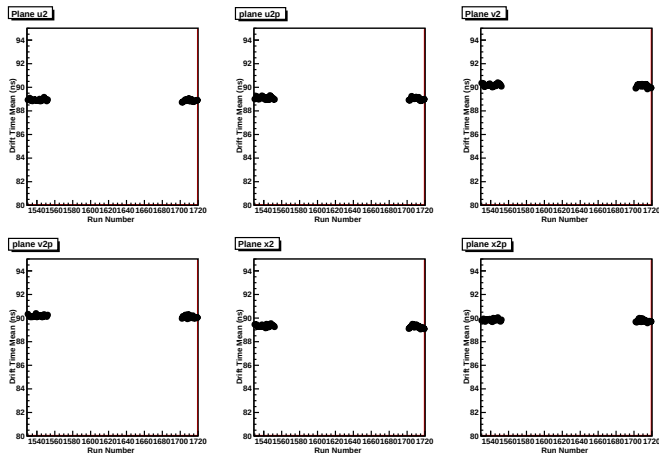


Figure: MWDC timing stability for S=0 chamber 2.

5.89 GeV t_0 Stability Chamber 3

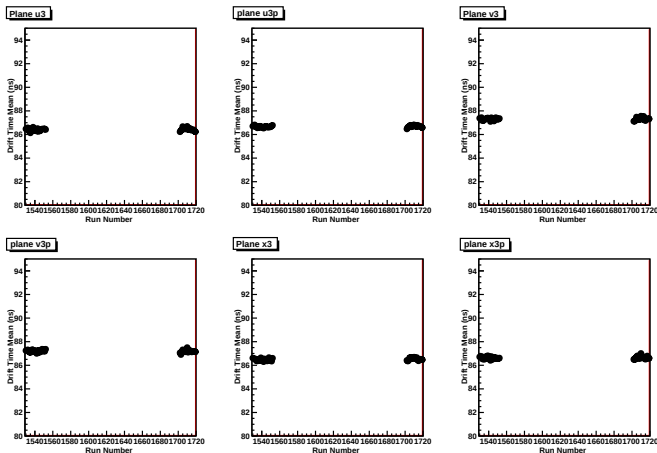


Figure: MWDC timing stability for S=0 chamber 3.

5.89 GeV Track Residuals Structure

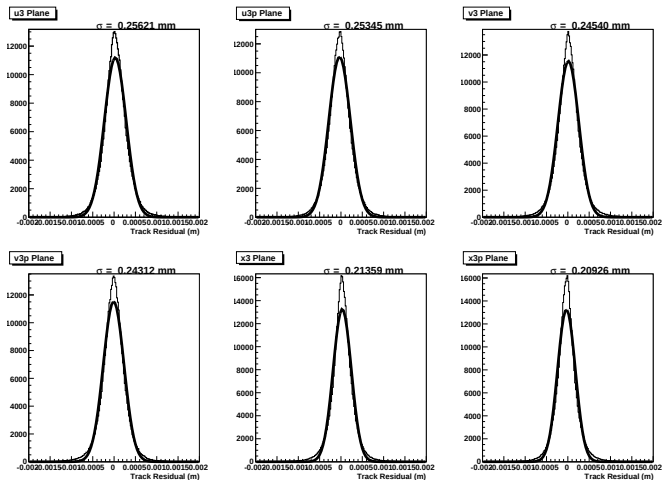


Figure: Characteristic MWDC tracking residual structure for S=0 data. This shows the residuals of chamber 3 for run 1539.

5.89 GeV Residual Stability Chamber 1

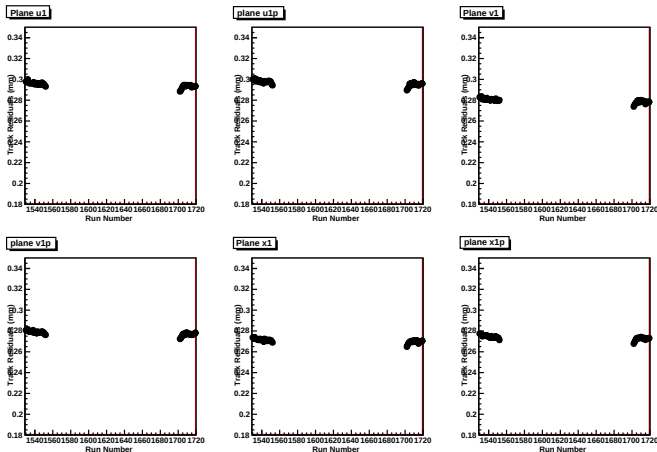


Figure: MWDC residual stability for S=0 chamber 1.

5.89 GeV Residual Stability Chamber 2

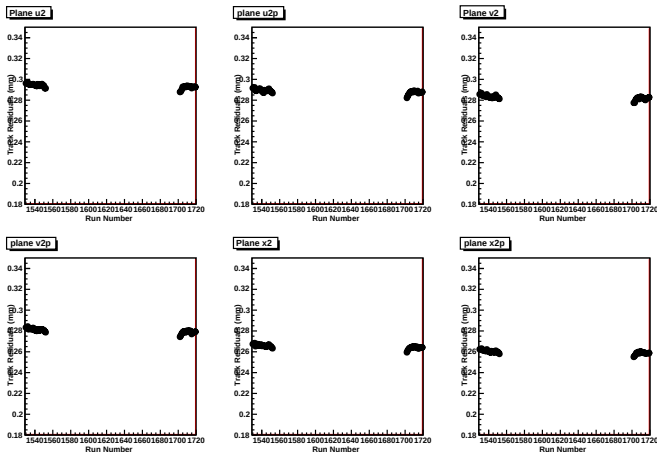


Figure: MWDC residual stability for S=0 chamber 2.

5.89 GeV Residual Stability Chamber 3

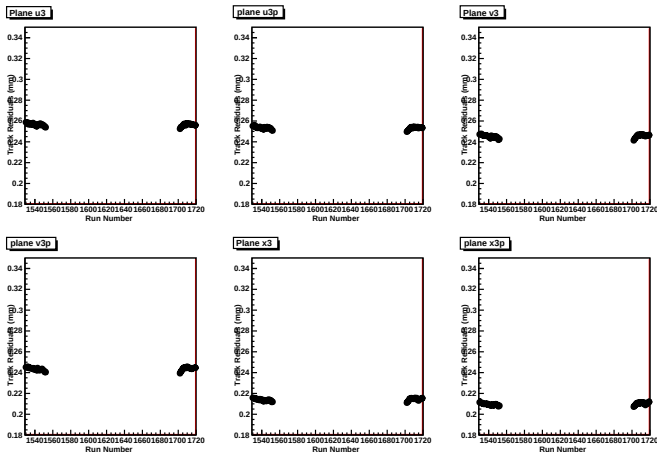


Figure: MWDC residual stability for S=0 chamber 3.

5.89 GeV Target Spin = 90° Runs

- Our target spin of 90° spans the run sets of:
- 1423-1448, With a Shower Threshold of -0.080 mV
- 1449-1470, with a Shower Threshold of -0.135 mV
- 1479-1498, with a Shower Threshold of -0.120 mV
- 1650-1701, with a Shower Threshold of -0.133 mV
- 1949-1998, with a Shower Threshold of -0.110 mV
- 2002-2020, with a Shower Threshold of -0.110 mV
- The MWDC during the S=90 there are periods which jump in mean timing and residual values
- The mean timing varies by 4-5.5 ns across the S=90 running
- The resolution of the residuals varies by about 50 μm across the S=90 running

5.89 GeV t_0 Structure

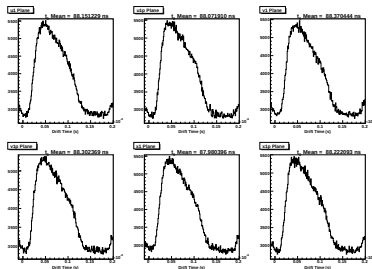


Figure: Characteristic MWDC timing of chamber 1 for run 1498.

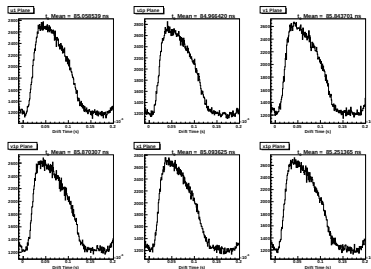


Figure: Characteristic MWDC timing of chamber 1 for run 1949.

5.89 GeV t_0 Stability Chamber 1

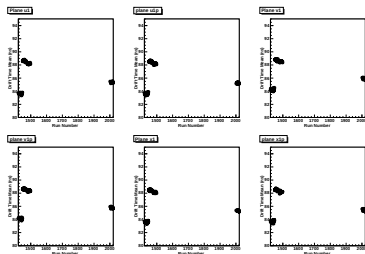


Figure: MWDC timing stability for S=90, wave-plate OUT, chamber 1.

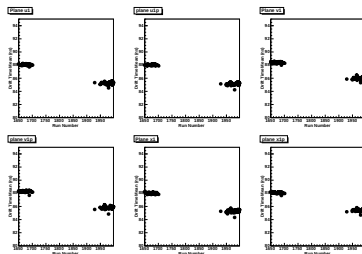


Figure: MWDC timing stability for S=90, wave-plate IN, chamber 1.

5.89 GeV t_0 Stability Chamber 2

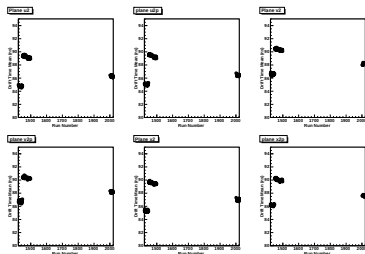


Figure: MWDC timing stability for S=90, wave-plate OUT, chamber 2.

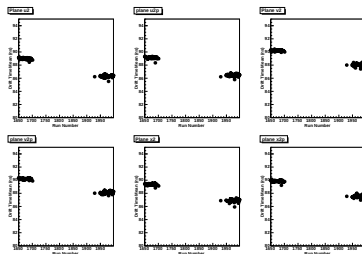


Figure: MWDC timing stability for S=90, wave-plate IN, chamber 2.

5.89 GeV t_0 Stability Chamber 3

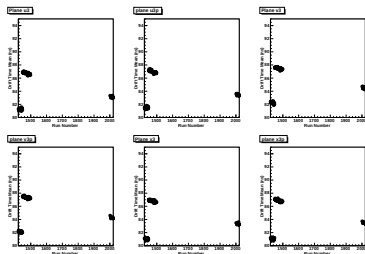


Figure: MWDC timing stability for S=90, wave-plate OUT, chamber 3.

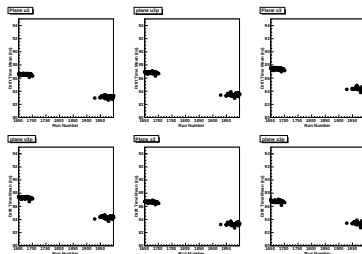


Figure: MWDC timing stability for S=90, wave-plate IN, chamber 3.

5.89 GeV Track Residual Structure

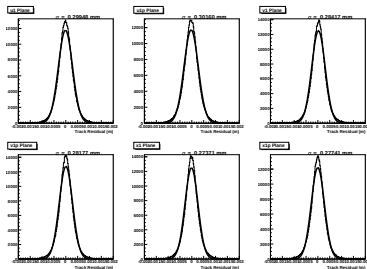


Figure: Characteristic MWDC residuals of chamber 1 for run 1498.

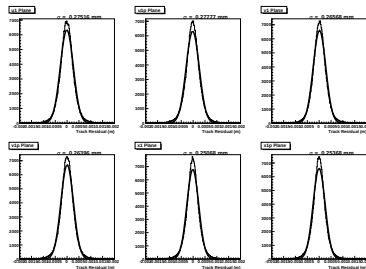


Figure: Characteristic MWDC residual of chamber 1 for run 1949.

5.89 GeV Track Residual Stability Chamber 1

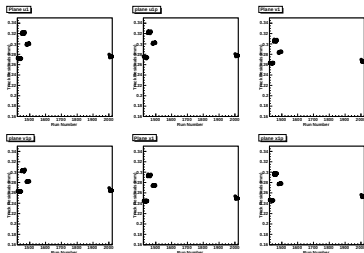


Figure: MWDC residuals stability for S=90, wave-plate OUT, chamber 1.

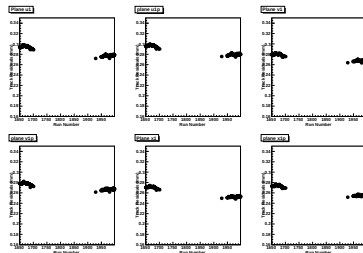


Figure: MWDC residuals stability for S=90, wave-plate IN, chamber 1.

5.89 GeV Track Residual Stability Chamber 2

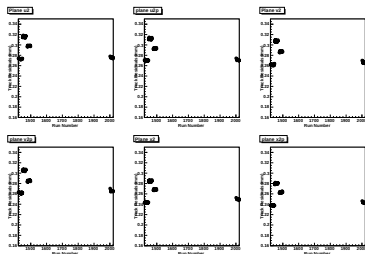


Figure: MWDC residuals stability for S=90, wave-plate OUT, chamber 2.

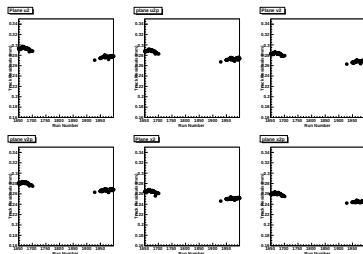


Figure: MWDC residuals stability for S=90, wave-plate IN, chamber 2.

5.89 GeV Track Residual Stability Chamber 3

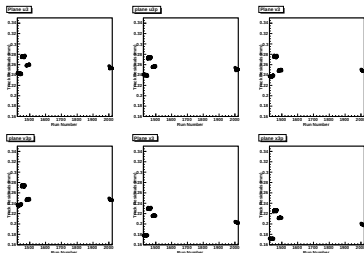


Figure: MWDC residuals stability for S=90, wave-plate OUT, chamber 3.

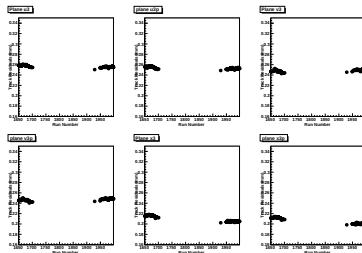


Figure: MWDC residuals stability for S=90, wave-plate IN, chamber 3.

5.89 GeV Target Spin = 270° Runs

- Our target spin of 270° spans the run sets of:
- 1311-1403, With a Shower Threshold of -0.133 mV
- 1411-1420, with a Shower Threshold of -0.080 mV
- 1499-1599, with a Shower Threshold of -0.120 mV
- 1600-1647, with a Shower Threshold of -0.133 mV
- 1848-1927, with a Shower Threshold of -0.110 mV
- 1311-1361, 1402 have a bad t_0 calibration.
- With the exception of runs 1311-1361, 1402:
 - Mean timing varies by about 2-5 ns
 - Residual widths vary by about $60 \mu m$

5.89 GeV Bad t_0 Calibration

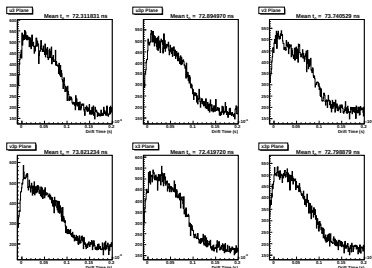


Figure: Result of a bad MWDC timing calibration for S=270. Timing of MWDC chamber 3 for run 1311 is shown.

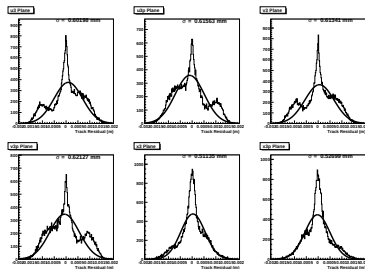


Figure: Result of a bad MWDC timing calibration for S=270. Residuals of MWDC chamber 3 for run 1311 is shown.

5.89 GeV t_0 Structure

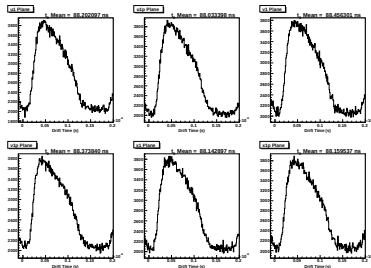


Figure: Characteristic MWDC timing of chamber 1 for run 1580.

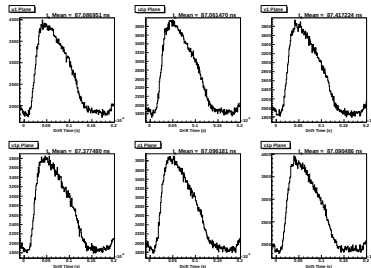


Figure: Characteristic MWDC timing of chamber 1 for run 1848.

5.89 GeV t_0 Stability Chamber 1

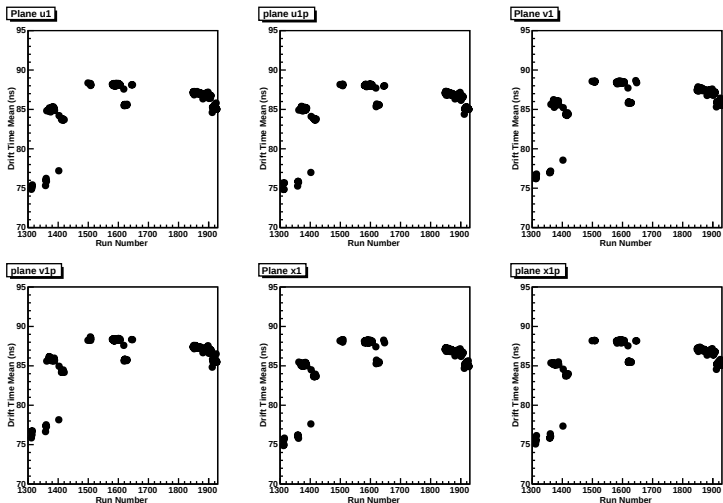


Figure: MWDC timing stability for S=270, chamber.1

5.89 GeV t_0 Stability Chamber 2

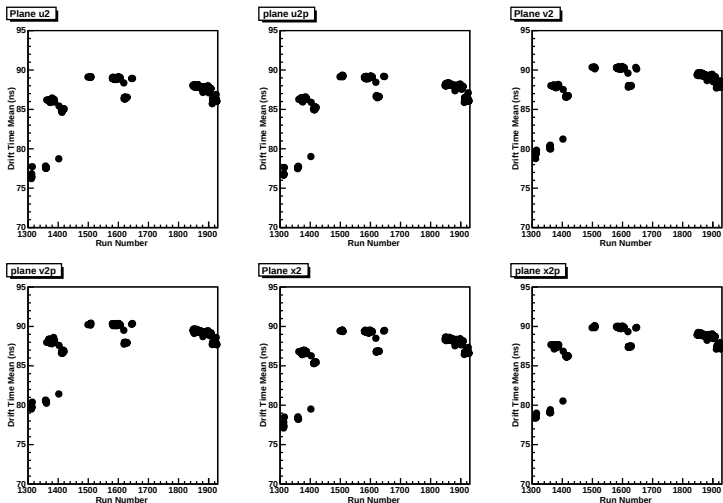


Figure: MWDC timing stability for S=270, chamber 2.

5.89 GeV t_0 Stability Chamber 3

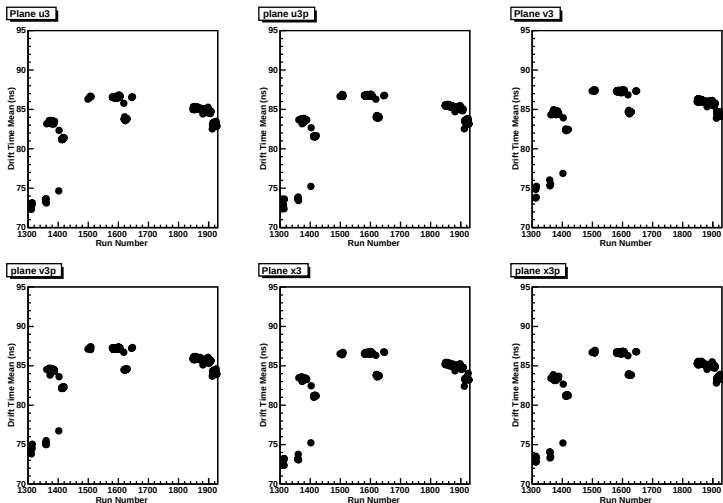


Figure: MWDC timing stability for S=270, chamber 3.

5.89 GeV Track Residual Structure

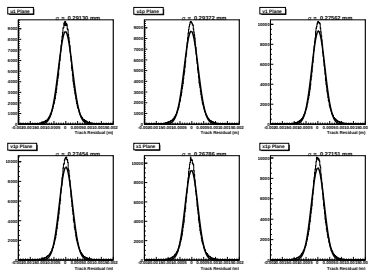


Figure: Characteristic MWDC residuals of chamber 1 for run 1580.

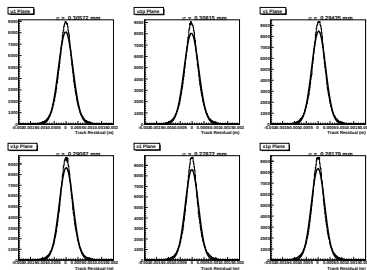


Figure: Characteristic MWDC residual of chamber 1 for run 1848.

5.89 GeV Residual Stability Chamber 1

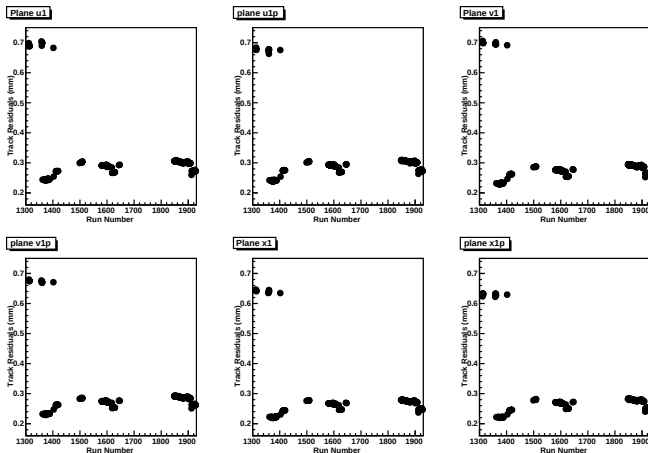


Figure: MWDC residual stability for S=270 chamber 1.

5.89 GeV Residual Stability Chamber 2

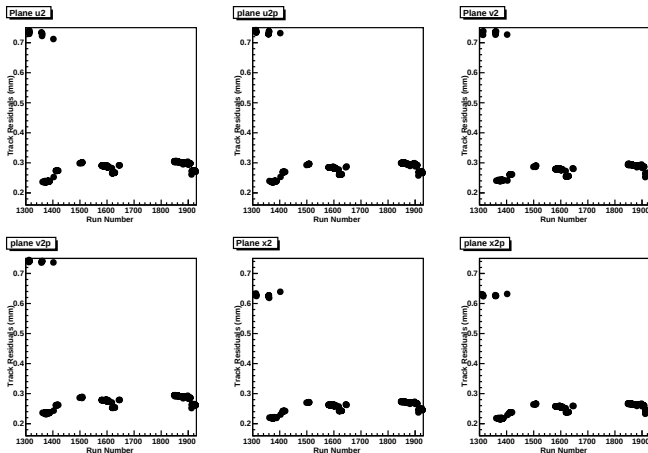


Figure: MWDC residual stability for S=270 chamber 2.

5.89 GeV Residual Stability Chamber 3

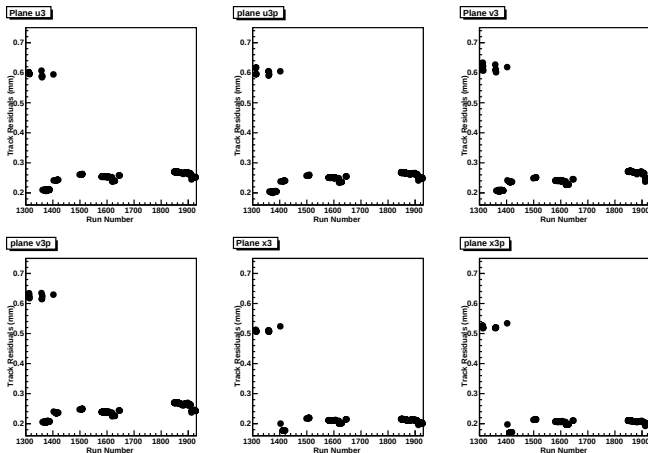


Figure: MWDC residual stability for S=270 chamber 3.